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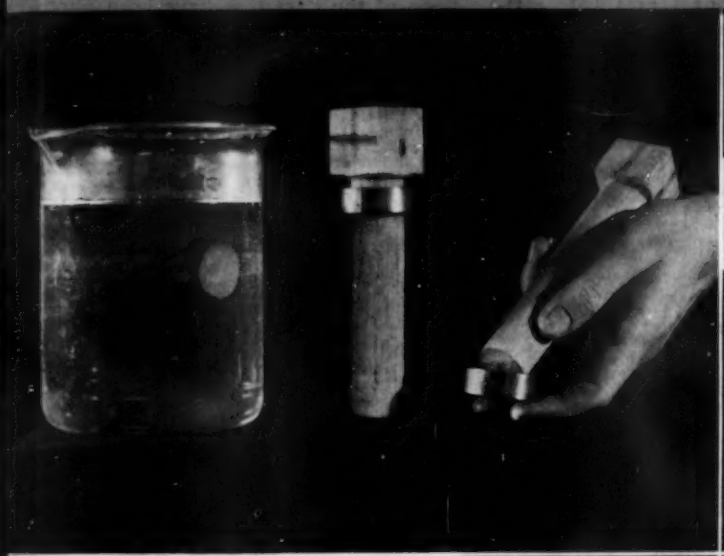

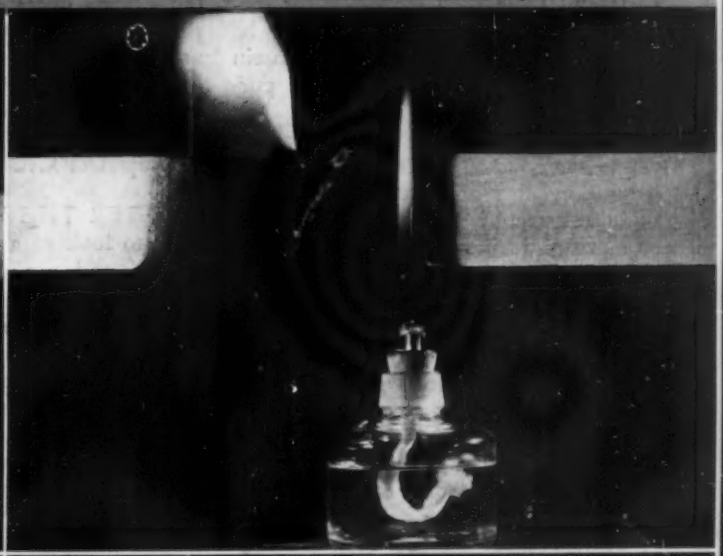

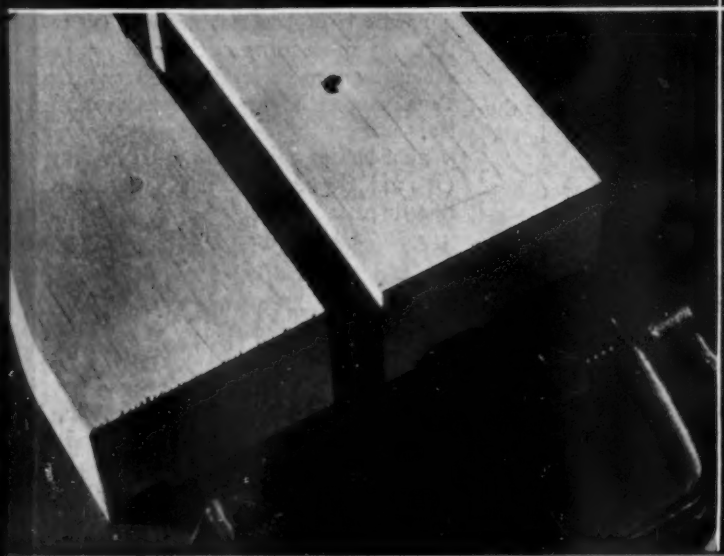

Wood Wonder

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A SCIENCE SERVICE PUBLICATION

MEDICINE

Blood Plasma Split

Constituent parts give many aids to war wounded: albumin used for shock, fibrin foam sponges to stop bleeding and globulins for other medical jobs.

➤ PLASMA from the blood you donate to the Red Cross is not only being sent up to the life-saving zones right behind the fighting lines in dried whole form. Plasma is a quite complex substance, and can be divided into its constituent parts and these used separately for special purposes, much as milk can be separated into cream for butter, casein for cheese, milk sugar for medical purposes, and so on.

Recent advances in split plasma utilization were described before the Philadelphia meeting of the American Philosophical Society by Prof. Edwin J. Cohn of Harvard Medical School. The speaker gave special attention to the principal types of proteins in plasma, notably the albumins, the globulins and the clot-forming substances.

Albumins, which form a high proportion of the total plasma proteins, are the chief factors in plasma's shock-preventing value, primarily because the large size of their molecules causes them to attract and hold water and keep it from "leaking" out of the body.

Albumin concentrates as high as 25% are now being regularly used in war medicine, Prof. Cohn stated. Blood albumins at this concentration are of the same viscosity, or "thickness," as natural blood itself which makes them easy to use. Similarly concentrated whole plasma could not be used because of other substances in it which would make it too viscous. Blood albumins are easy to handle under field conditions, the speaker added. They do not spoil in solution, even at tropic temperatures, so they do not have to be sent out in dried form, as whole plasma does.

Another important group of plasma proteins are the globulins. They constitute a very small percentage of the total, but have a role far outweighing their small bulk because they are what carries the blood's acquired powers of resistance to disease. These also can be separated out for use in particular medical jobs.

A third plasma protein group includes the substances that cause clotting and hence stop dangerous bleeding. Fibrinogen and thrombin are prominent among them. Separated out in solid form, they can be used during operations as absorbent wads, or sprinkled as powder, or spread as thin sheets. In the latter form, they have about the same stretchiness as nylon. Unlike surgical sponges, they do not have to be solicitously plucked out of the operational area before the patient is sewed up. Left in place, they are eventually absorbed through the body's normal physiological processes.

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Adapted Clothing

➤ AFTER THE WAR, it will be possible to look at a man in his working clothes and say with some assurance, "That man is a farmer," or a telephone lineman, or a tractor driver, or whatever he may be, just as we can now look at a man in uniform and tell whether he is a paratrooper, or a tank driver, or an aviator.

This will not be because the various trades and crafts will consciously choose distinctive costumes, as did the medieval guilds. It will be more because greater care is going to be given to designing work clothes for the special protection of the men in the jobs they have to perform, Col. Georges F. Doriot of the Army Quartermaster Corps told the meeting.

For generations, all kinds of workingmen have tried to make overalls and jumper, or a loose-fitting suit of coveralls, meet the requirements of all kinds of jobs. As a result, they have been unnecessarily exposed to the elements, as well as to the scrapes and bumps of their occupations, with inadequate protection. Loss of uncountable man-hours through illness and accident has been one of the results. The Army started out with a similar one-uniform notion, and had to learn at high cost the need for giving fighters protection from the elements and from the unavoidable risks of service.

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Stars Near Galaxy Center

➤ MOST of the stars and the unorganized chaotic matter that together make up the particular galaxy of which our solar system is a very small part are closer to its center than we are, the Philadelphia meeting was informed by a husband-and-wife team of astronomers, Prof. A. N. Vyssotsky and Dr. Emma T. R. Williams of the University of Virginia. In private life, Dr. Williams is Mrs. Vyssotsky.

Probably considerably more than 90% of all the matter in the galaxy is in the "down-town" direction from the position of our own sun, the two astronomers stated. They based their conclusions on recent measurements of the circling motions of the stars that have been photographed with two great telescopes, at the McCormick Observatory in Virginia and the Cape Observatory in South Africa.

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Single Sun Systems

➤ IF THERE ARE other planetary systems than our own, most of them must have a complicated time of it, studies by Prof. Peter van de Kamp of Swarthmore College indicated. Our sun is a single great glowing globe, and that's that: all the planets can go spiraling around it with no particular gravitational troubles. But evidence is increasing that single-star systems are the exception rather than the rule; many, perhaps most, of the stars consist of two, three or more suns circling about each other in more or less complex patterns. Prof. van de Kamp stated that the five stars nearest the earth average two component bodies apiece. What their planets (if any) do about such a situation was not discussed.

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ENGINEERING

Design Has Armor Built Right in Plane Structure

➤ DEFENSE is the theme of patent 2,346,809, granted to Robert J. Woods of Grand Island, N. Y., and assigned to the Bell Aircraft Corporation. Armor as applied to present-day warplanes is added after the plane is built, and thereby becomes so much extra weight, costly to carry around. It is Mr. Wood's idea to build armor plate directly into the structure of the plane, as wing beams, sides of fuel tanks and ammunition boxes, etc., thereby utilizing its structural strength as well as its resistance to attack by enemy missiles.

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CHEMISTRY

Soft Woods Made Hard

Ordinary wood converted chemically into harder grades with natural tendencies to swell, shrink and warp eliminated. New product is stronger and durable.

See Front Cover

➤ SOFT WOODS become harder than hard maple and maple wood is made harder than ebony by a new chemical process announced by Dr. J. F. T. Berliner of E. I. du Pont de Nemours & Company. The Du Pont announcement stated that it is a development by chemists of the company following a line of research that paralleled studies conducted by the Forest Products Laboratory of the U. S. Department of Agriculture.

This process makes timber markedly harder, stronger, stiffer and more durable, it is claimed. The natural tendency of wood to swell, shrink or warp with changes of humidity is eliminated. Furniture, for instance, made of the transmuted wood can be shipped throughout the world, to tropical jungles or arid deserts, and will remain in condition. Color may be imparted permanently throughout the material by the use of dyes in the impregnating material.

Four of the ways in which the treated wood is superior to the untreated are graphically illustrated by the pictures on the cover of this SCIENCE NEWS LETTER.

The test pictured at top left shows why drawers, doors and windows made of lumber treated by the new chemical process will not stick when the weather is damp. Brass rings were slipped on identical treated and untreated dowels, and the dowels placed in water for about 24 hours. Water swelled the untreated core piece so that the brass ring could not be removed. The treated dowel showed no observable dimensional change, and the ring slipped freely up and down the shaft.

In the experiment illustrated in the top right picture a stick of wood was ignited at the junction of treated and untreated pieces. The untreated piece burned, but the transmuted piece did not support combustion and was charred only where the fire made contact.

The increased hardness of the impregnated wood is shown by the lower left picture. The block of wood on the left does not have nearly as deep an indentation from the "C" clamp as the untreated block on the right.

The improved warp resistance of treated wood was quickly demonstrated as illustrated in the lower right picture by laying untreated (left) and treated (right) veneers on a wet towel.

The chemical agent used in this new process is called methylolurea and is made by compounding urea with dimethylolurea. Both these materials are white, water-soluble solids, produced from ammonia, carbon dioxide and methanol, more commonly known as methyl alcohol. Urea results from the reaction of ammonia and carbon dioxide. Formaldehyde, derived from methanol, condenses with urea to form dimethylolurea. Both urea and dimethylolurea are inexpensive chemicals available commercially.

The methylolurea is impregnated into the wood in a water solution. It reacts with the components of wood to form hard, water-insoluble, unmeltable resins within the piece of timber being treated. Heat, such as kiln drying, speeds the process.

The treatment can be used also to harden the outside portion of a piece of lumber without affecting the interior, obtaining results somewhat similar to those obtained in case-hardening steel. This treatment will be found desirable for certain types of construction such as trestles, bridges and towers.

Research on the hardening of soft woods by means of methylolurea conducted at the U. S. Forest Products Laboratory at Madison, Wis., eventuated in patent 2,298,017, issued Oct. 6, 1942, and patent 2,313,953, issued March 16, 1943. Rights in both these patents are vested in the Secretary of Agriculture, and the processes covered are open to public use.

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MINERALOGY

Fine Quartz Filaments Made With Bow and Arrow

➤ QUARTZ filaments, so fine that it would take 60 of them to make the thickness of a human hair, are drawn out in production in a relatively new method by use of a bow and arrow at the Westinghouse Research Laboratories. These superfine filaments are used to measure, or calibrate, the magnifying power of the electron microscope.

The bow, made of tough flexible steel, is mounted on a wooden stock. The arrow is shot out along a groove in the stock. In action the crossbow is placed in firing position and a small cylindrical piece of quartz attached to the rear end of the arrow. The quartz is heated by an oxy-hydrogen torch until it is just ready to melt. Then the arrow is released, trailing behind it as it goes gossamer-like threads of quartz. These are sometimes 20 feet in length.

To make this delicate thread a high initial burst of speed is required to spin out the quartz while it is in a hot fluid state and before it has a chance to harden. The crossbow does the trick.

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PHYSICS

X-Rays Measure Thickness Of Steel at 20 M.P.H.

➤ INVISIBLE X-ray fingers can measure the thickness of white-hot steel sheets squeezed out between rolls at a

MODERN WILLIAM TELL — Quartz filaments 1/30,000 of an inch in diameter, which are used as "measuring sticks" for the magnifying power of the electron microscope, are made with this cross bow in the Westinghouse Research Laboratories.

speed of 20 miles an hour and can do it so accurately that the rolling process can be controlled precisely by the X-rays themselves so as to keep the thickness the same.

Dr. William D. Coolidge, General Electric vice-president in charge of research, in receiving the prized Franklin medal at the Franklin Institute in Philadelphia, announced this newest development of the X-ray tube that bears his name.

Aside from their original medical uses, Dr. Coolidge said, X-rays now help make chemical analyses, measure distances between the atoms to determine crystal structure, reveal hidden flaws in steel and other material, detect strains in materials that might lead to failure, reveal the composition of very thin metallic specimens and delicate botanical and zoological tissue.

Million-volt X-rays are doing war work by inspecting welds and steel castings as thick as eight inches, Dr. Coolidge said, and they can do in two minutes what 400,000 volt X-rays took 3½ hours to do.

A Franklin medal was also awarded to Dr. Peter Kapitza, the Soviet physicist, who has been a leader in production of high magnetic fields and in liquefaction of gases.

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MEDICINE

Alcohol Rub Cures Boils

New 20-minute treatment gives complete and apparently permanent relief from infection. Number of successful cases too small for definite conclusions.

➤ COMPLETE, usually sudden and apparently permanent cure of boils by a new treatment consisting simply of a 20-minute alcohol rub is reported by Dr. Philip B. Price, of the University of Utah School of Medicine. (*Journal, American Medical Association,* April 22)

Dr. Price makes no claims for the method of treatment, he says, since the number of cases in which it has been used is too small for final conclusions as to its efficacy. Of many patients given this treatment in the last 10 years, he reports on 11. All of these had a more or less continuous succession of deep-seated boils occurring over a period of weeks or months. All had been treated unsuccessfully by other methods. All were followed for two years or more after the alcohol treatment. None had any further boils during this period.

The treatment should be given in the interval between the healing of the last boil and the onset of the next one, Dr. Price advises. The rubbing is done gently with gauze. A solution of ethyl alcohol 70% by weight, not volume, is used.

The treatment is based on Dr. Price's belief that one boil follows another because germs of the first one are smeared over the skin surface by discharges, sweat, bathing and friction. They become part of the germ population that resides permanently on the skin. There they may live and multiply without harm until by chance some of them are rubbed deeply into a hair follicle, whereupon a new boil develops.

Assuming this theory to be correct, rational treatment would consist in an attempt to sterilize the skin, that is, to rid it of all microorganisms, Dr. Price points out. Previous studies have showed that healthy skin can be "degermed" with the ethyl alcohol solution which Dr. Price found effective in curing boils. Harsher germ killers, such as iodine and carbolic acid, are likely to do more harm than good, he says.

Sulfa drugs, it is his impression, have not been very successful in treating boils.

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ARCHAEOLOGY

Pumpkins Tell Story Of Old Indian Cultures

➤ TRACING a story through the dim remoteness of unrecorded time was the task undertaken by Dr. George F. Carter of the Johns Hopkins University, when he tried to trace the unwritten history of American agriculture from tribe to tribe of Indians by checking up on the kinds of pumpkins and squashes they grew, reported at the Philadelphia meeting of the American Philosophical Society.

Pumpkins and squashes are all close botanical relatives, and all native American plants. At some time or other, some tribe began growing them, and selecting the seeds of the biggest and best kinds for further propagation. Related or neighboring tribes caught the idea, and it spread over a wide area.

Dr. Carter has found evidences, largely in old Indian graves and dwelling sites, that the domestication of squashes and pumpkins was started in a number of places quite independently of each other. One group, for example, spread the cultivation of the plants over the eastern United States, while another started on the west coast of Mexico.

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JEEP POWER—When the water power in a poverty-stricken Sicilian community failed, the people were desperate because their only means of crushing olives for oil was put out of commission. However, the ever-versatile American jeep proved a top-flight ambassador of good will; soldiers rigged it up to the crushing machine and with its power turned out 88,000 pounds of olive oil.

PUBLIC HEALTH

Danger for Heavy Smokers

➤ HEAVY SMOKERS are six times more likely to develop complications of the lungs following abdominal operations than non-smokers, reports Dr. H. J. V. Morton, Hillingdon County Hospital, Middlesex. (*Lancet*, March 18.)

In a study of 1,257 cases of abdominal operation, Dr. Morton grouped patients into three categories: 1. smokers (those who took more than 10 cigarettes or one-half ounce tobacco daily), 2. light smokers, and 3. non-smokers.

"Smoking seems definitely to increase the risk of complication causing constitutional disturbance," Dr. Morton contends.

Many smokers, it may be assumed, suffer from chronic inflammation of both trachea and bronchi, he points out. Under normal circumstances, the condition may be without symptoms and often overlooked.

After an abdominal operation, however, "restriction of efficient coughing brings about stagnation of bronchial secretion. The secretion accumulates and becomes infected and purulent and true bronchitis may follow. Where there is little or no post-operative interference with vital capacity or coughing, this succession of events is probably avoided at the outset."

Post-operative pulmonary complications are more common in men than in women and may be accounted for by man's greater dependence on diaphragmatic breathing, his normal respiration thus being more disturbed after an abdominal operation.

"A greater incidence of chronic infection of the respiratory tract in men associated with outdoor work in all weathers has been suggested," Dr. Morton says. "It has also been suggested that women have a higher immunity because of the hardening they undergo as the result of modern dress."

The striking difference obtained between post-operative lung complications for heavy smokers and light smokers among men as compared with similar figures for women may be attributed to the fact that many women coming into the "light smoker" group hardly smoked at all.

"Habitual pipe-smoking has far less significance than cigarette smoking," Dr. Morton observed.

"When abdominal operations are contemplated, it is advisable for smokers to stop or reduce their smoking as a precaution against pulmonary complications."

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ENGINEERING

Army Jeep Salvages Oil Crop in Sicily

➤ THE ARMY JEEP has added another page to its record of versatility by turning out 88,000 pounds of olive oil and salvaging a crop of olives for hundreds of families in western Sicily.

The water power needed to turn the huge stone wheels of an olive press on the Zucco estate outside Palermo had failed, and the tenants were faced with the probable loss of their food staple.

The press, on the second floor of the villa, could be reached only by means of a staired hallway. The jeep had climbed stairs before, but the hallway was too narrow.

The squad of engineers which Maj. Louis W. Correll of Spokane, Wash., called in to help simply turned the jeep on its side and carried it up the steps. As soon as it was in its proper place, they improvised a drive belt, made a few adjustments, the wheels rolled, and the olive crop was saved.

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PUBLIC HEALTH

Better Community Health Is Aim of Youths' Campaign

➤ MONDAY, May 1, boys and girls all over America will be meeting to plan their own campaigns for improving health conditions in their communities. This is a reversal of the Child Health Day activities that have been a part of the American scene since 1928, when Congress by a joint resolution authorized and requested the President of the United States to issue annually a proclamation setting apart May 1 as Child Health Day. In the past, grown-ups have been urged to make May 1 a day for renewing or starting fresh efforts to improve health conditions among children.

Now, however, with a war on, the grown-ups are all very busy and the boys and girls have shown themselves eager to take on as many adult responsibilities as possible. In line with these changed conditions, President Roosevelt in proclaiming Child Health Day this year has invited America's boys and girls

"to use this occasion as a time to gather with parents, teachers, and other citizens, or by themselves, in schools, churches and community centers, and to consider how we can make our home and community life contribute in full measure to the building of buoyant health and valiant spirit in all our boys and girls."

Food, housing, safety, recreation, and such matters of personal hygiene as exercise, sleep and rest are topics suggested by the U. S. Children's Bureau for consideration at the May Day planning forums. The idea, of course, is to decide on one or possibly two such health problems to be tackled during the coming year, but not to try to take on all the health problems of the community.

"People who run down their own health while trying to help others aren't smart," the Children's Bureau points out in a warning not to attempt too much.

Good advice on which is the biggest health job for boys and girls in your community can be had from the local health department, the local medical society, the parent-teacher association, church organizations and similar groups.

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MEDICINE

Leukemia Conquest Clue

Fatal malignant disease causing increased number of white blood cells can be prevented in rats by injections of adrenal or pituitary hormone.

➤ A NEW CLUE that may lead to conquest of leukemia, fatal malignant disease characterized by increased number of white blood cells, has been found in the adrenal glands.

Transplantable lymphatic leukemia can be prevented in rats by injections of the adrenal cortical hormone or the pituitary hormone that stimulates adrenal gland activity, Dr. James B. Murphy and Dr. Ernest Sturm, of the Rockefeller Institute for Medical Research, report. (*Science,* April 14).

Attempts to prevent the disease in humans by injection of adrenal cortical hormone will not be practical, Dr. Murphy said, unless or until some test can be devised for picking out persons with hormone deficiency likely to lead to leukemia.

As to treatment of leukemia, he and Dr. Sturm state that it would be "entirely unjustifiable" on the basis of the rat studies "to predict that the adrenal hormone would be of value in treating either the transplanted or the spontaneous disease."

Present importance of the studies seems to lie in the fact that they open an entirely new point of view for investigation. Heretofore efforts to control leukemia have been along the lines of attempting to destroy the malignant cells by X-rays or radioactive substances. Now it appears that this malignant disease may be controlled through the endocrine gland system, just as another malignant disease, cancer of the prostate, is apparently proving amenable to control via the endocrine glands.

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ASTRONOMY

January Eclipse Time

➤ WORD has been received at the Harvard Observatory clearing house from astronomers at Lima, Peru, giving more precise observed times for the eclipse of the sun on Jan. 25 than have heretofore been published. These make the actual duration of totality slightly more than 164 seconds, which is about three seconds less than the predicted duration.

Dean Godofredo Gracia of San Marcos University in Lima transmitted the results of observations by Prof. Alfred Rosenblatt and Juan M. Portocarrero. Their observations of the eclipse were made at the observatory in the Collegio San Jose in Chiclayo, Peru, close to the center of the path of totality and near where several other expeditions had made their headquarters, including the Mexican eclipse expedition headed by Dr. Joaquin Gallo, director of the National Observatory at Tacubaya, Mexico.

An important moment during an eclipse occurs when the moon first touches the sun's disk, making what astronomers call first contact. It is very difficult to determine this time by observation precisely, whereas timing the moment of second contact, when the moon completes its job of covering the sun's brilliant disk, is considerably easier because at second contact the last ray of direct sunlight is hidden by the moon just as if a camera shutter had been closed.

The predicted time for second contact of the Jan. 25 eclipse, according to the calculations of Lima astronomers, was 14 hours 7 minutes 33.6 seconds, universal time. Their observations showed the total phase to begin at 14 hours 7 minutes 34.25 seconds, or slightly later than predicted. Third contact, the end of totality, was predicted for 14 hours 10 minutes 20.9 seconds, but observed at 14 hours 10 minutes 18.53 seconds, or nearly two and a half seconds early. The total observed duration of totality was thus two minutes 44.3 seconds, or some three seconds shorter than the calculated time of two minutes 47.3 seconds.

The position of the observing site used by the Lima astronomers is given as longitude 79 degrees 51 minutes 23.42 seconds west; latitude 6 degrees, 47 minutes, 15.10 seconds south; altitude 28.57 meters.

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PSYCHOLOGY

Tests Show Marihuana Does Not Help

➤ MUSICIANS, especially members of dance orchestras, may think marihuana improves their musical ability, but psychological tests with a synthetic marihuana-like chemical show it does not, Dr. C. Knight Aldrich, U. S. Public Health Service, reports. (*Public Health Reports,* March 31.)

The tests were made with 12 healthy white male patients who volunteered for the experiment. All were serving prison sentences for violation of the Marihuana Tax Act and had used the drug for an average of nine and one-half years. Of the 12, two were professional musicians and two had musical ambitions.

The Seashore tests, played on phonograph records, were used "because they seemed to offer the most carefully standardized tests available of musical capability."

Each man was given the test three times at intervals of one week. The

first two were given without any drug, the third four and one-half hours after the drug. The dose and time interval produced a "kick" comparable to a satisfying amount of marihuana in most cases.

When asked whether they noticed any differences in their own performances on the tests, eight said they felt sure they had improved with the drug, three felt they remained the same, and one "couldn't say."

Actually, however, nine of the 12 had lower scores on the tests after the drug than on the second trial without it.

"The Seashore test," Dr. Aldrich points out, "measures only sensory musical capacity and leaves out of account such factors as motor-speed and coordination, release of inhibitions and fatigability, which could conceivably influence the playing of present-day music."

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GENERAL SCIENCE

Guggenheim Fellowships

➤ POST-WAR Guggenheim Fellowships from a special appropriation have been announced as awarded to five men either in the Army or engaged in war research. A total of $200,000, in addition to the usual Fellowship budget, has been set aside by the John Simon Guggenheim Memorial Foundation for fellowships exclusively for men and women now serving the Nation in the war effort.

Recipients of post-service Fellowships include Dr. Melvin Calvin, University of California chemistry professor now in war research, who plans to go to Soviet Russia after the war to study new methods of synthesis in organic chemistry. Joseph Hickey, an ornithologist now engaged in war research at the University of Chicago, proposes to analyze approximately 250,000 records of banded birds to learn their life expectancies, population turnover, and other facts of value to conservationists.

Sixty-nine Guggenheim Fellowships, totaling $155,000, were awarded for the year 1944-45 to American and Canadian scholars and creative workers. The list contains 13 women, the largest number ever to receive Guggenheim Fellowships in any one year. Two Negroes and one American-born Japanese were so honored.

Fellowships for work in the biological sciences are more numerous than Fellowships granted for work in any other field. Dr. Tilly Edinger of Harvard University will study the development of teeth in the evolutionary line leading from ancestral fishes to mammals.

Investigations of the causal factors involved in the embryonic development of vertebrates will be conducted by Dr. Johannes F. K. Holtfreter, one of the world's leading experimental geneticists. Of German origin, Dr. Holtfreter was sent from England to an internment camp in Canada. He was released from there upon the appeal of Canadian scholars who admire his work and have a high personal esteem for him. During the past two years he has worked at McGill University as the guest of the University and under the auspices of the Rockefeller Foundation.

The origins of corn and tomatoes, food plants indigenous to the Western Hemisphere, will take two Fellows to Latin America. Dr. Paul Weatherwax of Indiana University will go to the highlands of Peru and Bolivia, one of the great pre-Columbian centers of agriculture, where corn may have been domesticated. Dr. James Angus Jenkins of the University of California at Berkeley will study variental differences in cultivated tomatoes in the state of Jalisco, Mexico.

This is the 19th annual series of Fellowship awards by the Foundation, established and endowed by the late United States Senator Simon Guggenheim and his wife as a memorial to their son John. Fellowships are granted to scientists, artists, writers and others who have shown creative abilities in their previous work.

Citizens of the United States and Canada, and of certain Latin-American countries, are eligible on equal terms. The stipends usually amount to $2,500 a year. Those announced now were granted to Americans and Canadians; a series of Fellowships for Latin Americans will be granted in June.

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ENGINEERING

Speed Motion Pictures Used To Study Stoker Fuel

➤ "SPEED-UP" motion pictures in color are used in a new method of determining efficiency and economy of combustion in stoker fuel beds in industrial furnaces. Pictures were shown and the method explained by Otto de Lorenzi of the Combustion Engineering Company, New York City, at the meeting of the American Society of Mechanical Engineers in Birmingham, Ala. Ordinary motion pictures of stoker fuel bed movements are too slow to have value in studying the burning coal behavior.

"The general impression gained, when looking into a stoker-fired furnace, is that the fuel bed is motionless, incandescent and active," he stated. "While the actual motion is very slow, nevertheless it is positive and regular. The slowness makes it difficult for the human eye to see, follow and remember successive steps during any given cycle. Consequently, to have a true picture of sequence of operation and resulting changes, the action must be speeded up."

Interval photographs pieced into a continuous motion picture are found satisfactory for complete analysis of coal behavior in the various fuel bed zones. The exposure rate can be adjusted to secure any desired degree of speed-up. The studies made by this new method are being used in improved designing and engineering.

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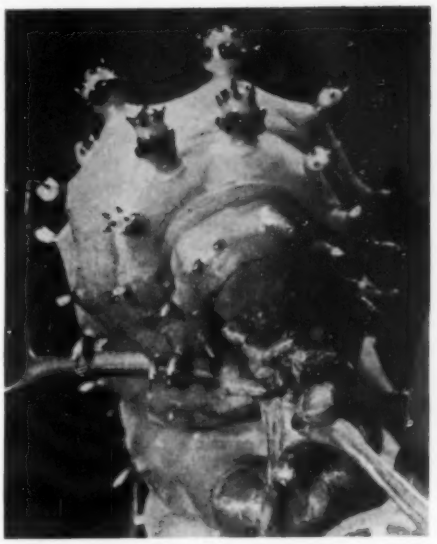

WORM'S EYE VIEW—One look at this miniature monster should be enough to scare away most of its natural enemies. A mature Cecropia caterpillar is about four inches in length and bluish-green in color. It is armed with rows of spiny tubercules which are red with spots of black near its head, yellow along its back and blue on the sides. Photograph by George A. Smith, Quarryville, Pa.

TEXTILES

Soldier Can Be Wet But Warm in Certain Fabrics

➤ WET BUT WARM is a possibility for a soldier exposed in rainy cold weather if dressed in a fabric with a high wool content and the fabric is constructed so that as little of it as possible is in touch with the skin. The National Bureau of Standards has just concluded studies which not only confirm general experiences with wet clothing, but also emphasize the superiority of fabric construction that minimizes the area in contact with the body.

In the tests, various wet wool fabrics were laid on an artificial skin surface, and measurements were made of the extent of contact and of the drop in temperature of the artificial skin. Fabrics that made good contact with the surface produced considerable chilling in the skin; those that made poor contact because of the roughness of the weave caused only a relatively small drop in the temperature. Fabrics with a high percentage of wool caused less drop in temperature than those with lower wool content.

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MEDICINE

Rockefeller Foundation Was Angel of Penicillin

➤ THE ROCKEFELLER Foundation was the financial angel for the early stages of development of penicillin and blood albumin, substitute for blood plasma, it appears from the annual report of Raymond B. Fosdick, president of the Foundation.

A grant in aid of $1,280 made in 1936 to Prof. H. W. Florey, of Oxford University, enabled that scientist to develop the chemical laboratory in which pioneer work on the clinical use of penicillin was done. Two further grants of $5,000 each were made in 1939 and 1940 directly for the work with penicillin and it was a special travel grant from the Foundation which brought Prof. Florey and his associate, Dr. N. C. Heatley, to the United States in 1941 to confer with scientists on the possibilities of large-scale production of the germ-fighting mold chemical.

Blood albumin transfusion units, each taking less than one-sixth the space and about one-seventh the weight of a plasma transfusion unit, are now under commercial production at seven plants under Navy contract. Development of this life-saving aid for our armed forces came from Harvard Medical School's laboratory of physical chemistry under the direction of Dr. Edwin J. Cohn. Rockefeller Foundation contributions to the laboratory, totalling some $200,000, were started in 1930 when its work on the physical-chemical properties of large protein molecules seemed far from any practical application.

This same laboratory's program of "mining" human blood for materials that can be used to treat or prevent illness has led to development of concentrates of measles antibodies. These were used with beneficial results in prevention and treatment of the disease in epidemics last winter in Philadelphia, Baltimore and Boston.

Blood "mining" has also produced films, plastics and foams used in neurosurgical operations, to control hemorrhages and for other purposes.

Science News Letter, April 29, 1944

AGRICULTURE

Insect-Collecting Machine Can Be Run on Tractor

➤ FARM crop-destroying insects may soon find themselves blasted from the plants on which they feed or rest, and blown by the blast of air into a container for destruction. This will be done by an insect collecting machine, designed for mounting on the front of a farm tractor. Patent 2,346,270 on this device was granted to Alexander R. Nisbet, Plainview, Texas.

The machine consists of a rotary bellows attached in its housing to the front of the tractor and operated by a fan belt from the tractor's drive wheel. The blast of air is directed downward through a conduit with two opposite curved ends out of which the air is expelled to the right and the left against the rows of plants on each side.

Opposite the air-blast openings, and on the outside of the plants, are enlarged receiving conduits into which the insects are blown and moved upward into bag containers which hold them but permit the air to escape. These conduits also support the plants from breaking in the blast.

The frame composed of the air-blast conduit and the collecting conduits is adjustable telescopically so that insect collections may be made at any height from the ground. The machine is particularly effective with potato and cotton crops, it is claimed.

Science News Letter, April 29, 1944

IN SCIEN

PSYCHOLOGY

Custard Pie Humor Recommended for Navy

➤ CUSTARD PIE humor and other laugh-producing techniques of movie comedies may serve a serious purpose in relaxing war-strained nerves of Uncle Sam's sailors on ships at sea and distant advance bases if the Navy follows the recommendation of Lt. J. E. Baurenschmidt, USNR, speaking before the Society of Motion Picture Engineers in New York City.

Training films will be more effective, Lt. Baurenschmidt believes, if humor of all possible types is used in the films to get a laugh. The best teaching, he said, is done in a relaxed atmosphere, and humor is one of the most effective methods of creating a relaxed atmosphere.

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FORESTRY

Lumber From Empress Tree May Become Important

➤ THE PAULOWNIA, or Empress tree, long grown in America as an ornamental, is now attracting the attention of lumbermen who see in its fairly strong, light-weight lumber a material suitable for crating and boxing articles to be shipped by airplane. It is now common in much of the eastern half of the United States as far north as New York.

Paulownia wood, used commercially in Japan for 30 years, is fairly coarse in grain, glues well, resists warping to a remarkable degree, and has considerable strength for its weight. A cubic foot weighs from 14 to 19 pounds, about twice as much as balsa and one-half as much as white pine. Its physical properties have not yet been thoroughly tested in the laboratory as far as known.

The use of Paulownia lumber commercially is advocated in *American Forests* by Joseph L. Stearns of the National Lumber Manufacturers Association. He reviews its use in America for ornamental purposes since first imported from Japan in 1834, and some of its possible commercial uses in the United States.

Science News Letter, April 29, 1944

E FIELDS

AERONAUTICS

Airplane Has Real Teeth For Slashing Enemy Craft

➤ TEETH, merely painted on the shark-like noses of some present-day fighter planes, become real and capable of inflicting deadly bites in an invention on which patent No. 2,346,689 has been issued to a soldier-civilian team of aircraft designers, Gen. Robert Kauch of the Army Air Force and Charles L. Paulus of Wright Field, Dayton, Ohio.

The idea is simple but wicked: the forward edges of the wings, and possibly parts of the side of the fuselage, are armed with sawtoothed strips of metal, so that when a swift fighter swoops onto the tail or other exposed part of an enemy plane the toothed edge will bite right through, sending the luckless enemy spinning down to a crash.

Rights to the patent are granted, royalty-free, to the government.

Science News Letter, April 29, 1944

MEDICINE

$2,000 Mayer Award Given Scientists in Chile

➤ DISCOVERY that certain hormones and synthetic chemicals may become weapons for fighting tumors of the uterus which develop in women during the child-bearing period has won the second $2,000 Charles L. Mayer Award for Dr. Alexander Lipschutz, director of the department of experimental medicine of the Chilean National Health Service at Santiago, Chile.

Formal presentation of the award was made April 24 in Washington, D. C., at the meeting of the National Academy of Sciences which administers the award through its National Science Fund, Dr. William J. Robbins, chairman of the fund, and director of the New York Botanical Garden, has announced.

Dr. Lipschutz was born in Riga, Latvia. During the last six years he and the Chilean scientists working in his laboratory have studied the fibromyomas of the uterus which can be induced in guinea pigs by the injection of certain sex hormones of the female. The growths closely resemble the fibromyomas ("fibroids") which occur in women during the child-bearing period, and Dr. Lipschutz has shown that like these they dwindle and vanish when the stimulation of the sex hormones is withdrawn, as happens after the menopause in women. He and his associates have sought means to prevent the occurrence and enlargement of the growths while the hormones are still acting and recently they have found that some other hormones, from other organs, have this effect, as do also certain substances synthesized by chemists. The molecular configurations responsible for the influence of the anti-fibromatic agents are now under investigation.

Science News Letter, April 29, 1944

CHEMISTRY

South Carolina Chemist To Receive Herty Medal

➤ PRESENTATION of the Herty Medal to Dr. James Edward Mills, chief chemist of the Sonoco Products Company, Hartsville, S. C., will be made at the Georgia State College for Women on May 6.

This medal, named after the late Charles H. Herty, known for his production of paper from Southern pine, is awarded annually to the scientist making an outstanding scientific contribution to the South.

Dr. Mills has applied chemistry to various phases of Southern industry.

Science News Letter, April 29, 1944

RESEARCH

Heart Disease Research Aided in Mexico

➤ WITH MODERN equipment and a large new building, Mexico's new National Institute of Cardiology has inaugurated its research program upon the problem of heart disease, an important cause of death.

President Manuel Avila Camacho, in connection with the dedication, announced that the Mexican government would make possible many other similar institutions for research in other fields of science.

Close coordination of the Mexican investigational program with research in the United States was promised by Dr. Ignacio Chavez, director of the Institute. Dr. Paul D. White, Harvard University cardiologist, and Dr. Agustin Castellanos of Havana joined in plans for such cooperation by medical scientists from the various American republics.

Science News Letter, April 29, 1944

ANTHROPOLOGY

Navajo Sand Paintings Copied for Preservation

➤ SYMBOLIC pictures, for centuries painted by Navajo medicine men in the sand, have only recently been copied for preservation.

Most ancient type of painting practiced by the Southwestern Indians, the symbols of sand painting, because of their association with religious observances and health cures, have been kept as secret as possible and have rarely been seen by white men until the present century.

Reproductions of sand paintings, made by staff members of the Museum of Navajo Ceremonial Art in Santa Fe, N. M., and now on exhibit at the Southwest Museum in Los Angeles are painted in the five sacred colors of Navajo mythology—white, blue, yellow, black and red—and represent in conventional forms various supernatural beings, divine ceremonies and objects of nature.

Originals were created by pouring pigments derived from powdered sandstone, charcoal and plant materials on the sand-covered floor of the ceremonial hut.

When the picture was completed, the patient was seated on the painting and given an infusion of the colors to drink, while sacred chants were being sung.

The rites over, the medicine man destroyed the picture, and the sand of which it was made was gathered in blankets and thrown away.

Science News Letter, April 29, 1944

CHEMISTRY

Researcher in Magnesium And Styrene Gets Medal

➤ DISCOVERING how to make enough magnesium to produce thousands of warplanes and sufficient styrene to supply our needs for synthetic rubber has won the 1944 Gold Medal Award of the American Institute of Chemists for Dr. Williard Henry Dow, president of the Dow Chemical Company of Midland, Mich.

One of the foremost leaders of research in this country, Dr. Dow's vision has opened new avenues of chemical development and inspired young chemists to greater endeavors. The coveted Gold Medal will be presented at the Institute's annual meeting, May 13, in New York.

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ASTRONOMY

Twins Become Triplets

Mars joins Castor and Pollux in Gemini on May evenings. Hydra is the largest constellation, covering 3.16% of the total area of the sky.

By JAMES STOKLEY

➤ THIS MONTH the familiar constellation of the twins looks as if it had become triplets!

Toward the west on May evenings there appears the constellation of Gemini, the twins, one of the few remaining of the groups that were so conspicuous to the south in the skies of winter. The two brightest stars in Gemini are Castor and Pollux. Near together, of not greatly different brilliance, they do suggest the pair of brothers which, in mythology, they represent. But in May there are three objects there in a row, almost equally spaced. The newcomer is the planet Mars, to the left of the actual twins. Because it is now quite far away, Mars is relatively faint, of magnitude 1.7. It is fainter than Pollux, the twin nearer to it, but a little brighter than Castor. Mars and Castor both would be called second magnitude, while Pollux is included among the stars of the first magnitude.

Positions Shown on Maps

The positions of these stars and their planetary visitors are shown on the accompanying maps, where the appearance of the heavens is depicted for about 11:00 p. m. (your local war time) on May 1, and an hour earlier in the middle of the month.

In the west another planet appears—Saturn, in the constellation of Taurus, the bull. As shown on the maps, most of Taurus has set, with only one star remaining, near which Saturn is shown. This planet is now of magnitude 0.3, which places it in brilliance among the brightest first-magnitude stars but, when as low as it is mapped, the absorption of the earth's atmosphere dims it greatly.

Jupiter in Better Position

The third May planet is in a better position. This is Jupiter, in Leo, the lion, and close to the sub-group known as the sickle. Jupiter is of magnitude minus 1.6, which is about twenty times the brilliance of Mars, brighter, indeed than any other object in the evening sky (except for the moon, which passes it May 28).

Looking toward the south these May evenings, it is possible to see well placed the two largest constellations in the sky, which happen to be next-door neighbors. Hydra, the water monster, is the largest, its position indicated on the maps. As it contains no star brighter than the second magnitude, it is not a conspicuous group, but it can easily be located. The head is about half-way between Jupiter and Procyon, the lesser dog-star. From here a long stream of stars extends to the left, passing under the little figure of Corvus, the crow, which is shaped like the mainsail of a ship. No other constellation stretches over so great a length of sky as Hydra. It covers about 3.16% of the total area of the sky.

Virgo Above Hydra's Tail

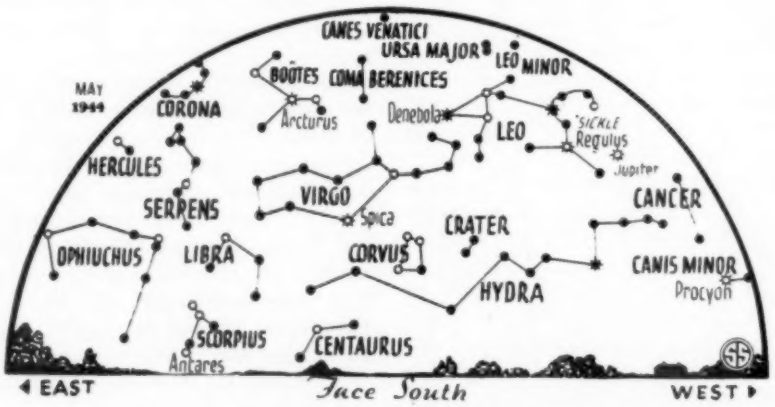
The second largest constellation is just above the end of Hydra's tail. It is Virgo, the virgin, and does contain a first magnitude star, called Spica. A good way to find it is to start high in the north with the familiar Great Dipper, in Ursa Major, the great bear (which, incidentally, ranks third in order of size). The handle of the dipper points upward. Follow its curved line to the south. The first bright star this brings you to is Arcturus, in Bootes, the bear driver, and then Spica. From there, the curve proceeds to Corvus. Virgo is important because it is one of the constellations of the zodiac, through which move the sun, moon and planets. It covers 3.14% of the whole sky, while Ursa Major, the next, covers 3.10%.

At the other extreme from these enormous constellations is Crux, the Southern Cross, only .17% of the total, a nineteenth the size of Hydra. The cross cannot be seen from most parts of the United States, though it rises just over the southern horizon in southern Florida and the southernmost tip of Texas; south, that is, of latitude 28 degrees. The cross is directly below Corvus, so a May evening, about the time for which the maps are drawn, is the time when the cross can best be seen from these southerly points.

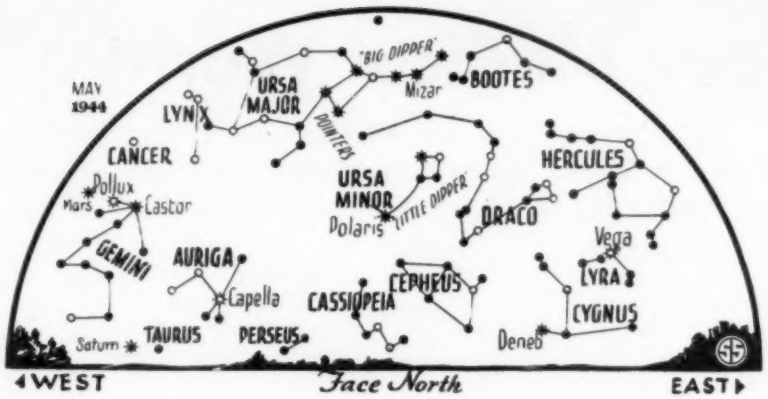
Equuleus, the Little Horse

Slightly larger, with a little more than .17% of the sky, is the constellation of Equuleus, the little horse, which is the second smallest constellation, and the smallest visible from the greater part of the United States. It is not, however, visible in the evening just now, but will be in September, when it will be seen near Aquila, the eagle.

The smallest constellation shown on the accompanying maps is Corona Borealis, the northern crown, seen high in the east near Arcturus, with .18%. There are 15 constellations that are smaller, however, most of them southern ones. But just next to Corona, toward the left, is Hercules, the champion, which is fourth largest, with 3.00% of the sky. Third largest is Cetus the whale, visible in the winter evening sky, very slightly larger than Hercules.



SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



A person interested in knowing more about the relative sizes of the constellations, as well as a great deal of other interesting material about them, will find these data given in the new third edition of *A Guide to the Constellations* by Samuel G. Barton and William H. Barton. An excellent series of twelve large charts shows the skies month by month, while the text and a number of tables give a wealth of astronomical information. There is probably no better book to introduce one to naked eye astronomy.

Celestial Time Table for May

May	EWT	
2	7:00 a. m.	Moon farthest distance 251,400 miles.
	1:00 p. m.	Mercury between earth and sun.
8	3:28 a. m.	Full moon.
15	7:12 a. m.	Moon in last quarter.
17	6:00 p. m.	Moon nearest: distance 228,900 miles.
22	2:12 a. m.	New moon.
23	11:37 p. m.	Moon passes Saturn.
26	8:37 p. m.	Moon passes Mars.
28	6:13 a. m.	Moon passes Jupiter.
29	4:00 p. m.	Mercury farthest west of sun.
	8:06 p. m.	Moon in first quarter.
30	2:00 a. m.	Moon farthest: distance 251,100 miles.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

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MEDICINE

Hole in Esophagus

Soldier back from North Africa has perforation in his esophagus. Is unique condition, not result of wound. Surgeon expects it to heal by itself.

➤ CONVALESCING now at Walter Reed General Hospital in Washington is a soldier back from the North African campaign with a hole in his esophagus. He is Pfc. Otis Lumpkin, of Richmond, Va. By all the medical books, he should be dead, but he is very much alive and looking forward to resuming his war-interrupted career as a tenor. He may get well enough to go back to active duty as a soldier.

His condition, rare in medical experience, is not the result of a wound or an injury. It may have been due to an ulcer which ate its way through the wall of his esophagus. The esophagus, or gullet, is the passageway for food from throat to stomach. The most common cause of a perforation in the esophagus is cancer, but the surgeons at Walter Reed know from examinations they have made that he does not have cancer.

Such a hole in the esophagus sometimes results from swallowing a fish bone or chicken bone in childhood, but there is no history of that in this case.

"The principal point of importance about the case," the surgeon in charge of chest surgery at Walter Reed stated, "is that he is alive in spite of all. Most patients who have this condition die."

Whatever may have caused the condition, the first the patient knew about it was shortly after an evening meal in Tunisia some eight months ago, when he became violently nauseated and had one sharp regurgitation, or what the layman would call a "burp," of clear water. This was accompanied by "terrible pain" in the abdomen which moved up into his chest as he breathed. (The hole in his esophagus is at the lower end, right at the level of the diaphragm which separates the chest from the abdomen and moves as one breathes.) The doctors are sure that what he ate at mess that evening had nothing to do with the condition which, as one doctor told him, might have been present or developing for 10 years. They do not believe his singing could have caused it.

He was given a sedative that night and sent the next morning to a General Hospital of the British North African Forces, the only hospital in the vicinity at the time with facilities for treating such an unusual case. There a hole was cut into his chest in back and a tube inserted to drain off the fluid which had accumulated. Another tube was put through an opening made into his stomach through the abdominal wall and he was fed through this tube.

At first the feedings through the tube consisted of milk given every two hours day and night. Later these were changed to "meals" of milk and egg twice a day and, after he had been transferred to an American hospital, puréed baby foods were added. He remembers particularly one "meal" consisting of a milk shake with puréed beets and a few vitamin tablets ground up in it.

Strange as these meals may have looked, they were nourishing. Tube feeding was the only method that could be used, since everything he swallowed went through the tiny hole in his esophagus and into his chest. If he drank a glass of milk, by the time he swallowed the last drops, he could feel the first swallow running down his back, from the drainage tube in his chest.

After two months in the British hospital and about two and one-half months in an American hospital in Algiers, he was brought back to Walter Reed where he is now improving steadily. He is eating solid food and the tube into his stomach is no longer used. The drainage from the chest is very slight.

The hole in his esophagus seems to be healing. Occasionally liquids leak through it into his chest and drain out the tube in back. Once it was a glass of ice water and once a glass of beer, the patient related. He is able to be out of bed for two or three hours at a time and is regaining his strength.

The surgeon at Walter Reed believes the perforation will heal completely by itself. If not, the "formidable" operation of opening the chest and sewing up the perforation will be necessary. Otherwise, the only surgery the patient will need will be to close the openings where there are now tubes into his chest and stomach.

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Do You Know?

Plastic *plumbing* now used in aircraft is 50% lighter than old-time metal.

Coating the surface of a farm smoked *ham* with salad oil will delay the development of surface mold.

Consumption of *silver* in 1943 totalled 118 million ounces, with 71 million ounces being accounted for by essential industries.

Occupied *Holland* in 1943 produced one-half as much milk as in 1940, less than one-half as much butter, and one-third as much cheese.

Carbon brushes for electric generators, now in use in aircraft, last several hundred times as long in high altitudes as those previously used.

Pearls are occasionally found in the shells of the abalone, an edible univalve species of snail found under water on rocks off the California coast.

With increasing demand for motor and motor vehicle crates, a monthly production of *hardwood plywood* totaling 42 million square feet will be needed to meet 1944 requirements.

We entered the war with 10,000 fewer *locomotives* and 600,000, or 25%, fewer freight cars than in 1917; however, modern cars average 25% greater capacity and are moved 50% faster.

South American alpacas, llamas and other similar *high-altitude animals* are able to live in high mountains because they require relatively little oxygen to breathe or water to drink, and have heavy fleeces.

Over 6,000,000 loofa *sponges* were produced in Cuba in 1943; this material, formerly obtained from Japan and China, is the entangled fibrous mass in the inside of the loofa gourd and is used as water filters in marine engines.

Scrap rubber turned in by the public since 1942, totalling some 750,000 tons, is being used at a rate of about 35,000 tons a month to make vital military products, and for recapping civilian auto tires, and for other purposes.

MEDICINE

Navy Medical Warfare

New type care developed for U. S. servicemen wounded in South Pacific amphibious fighting gives them better chance for recovery than any fighters in history.

➤ A COMPLETELY new but carefully developed phase of medical care is giving American servicemen wounded in the fierce amphibious warfare in the South Pacific a better chance of recovery than any fighters in the history of military medicine.

Baptized in the fire of the Solomons invasions, and functioning smoothly in the brilliant Marshalls attacks, the new phase brings men back alive who would have been left to die on the field in the last war. The story of this dramatic medical warfare, was told to a Science Service representative by Capt. Lucius W. Johnson (M.C.) USN, who has just returned to Pearl Harbor from combat areas in the South Pacific, where he helped organize naval medical facilities, literally in the foxholes themselves.

Actual statistics of the number of recoveries among wounded U. S. fighters and the numbers of men removed to rear area hospitals without mishap are military secrets, but the percentage of success is one of the bright spots of the Pacific war, Captain Johnson believes.

He told Science Service:

"The most striking thing about this war is the difference in hospital wards in combat areas compared to the last war. Then, tetanus, gas gangrene and huge suppurating wounds met the physician's eye on every side, and evidence of great suffering was everywhere.

"Today none of these things is seen. The men are well nourished and comfortable, and their recovery virtually certain," Captain Johnson said.

Behind this morale-building improvement in the care of war's casualties, is a swift chain of events beginning with a naval hospital corpsman in the foxhole and ending with the aseptic steel of expert surgery in luxury-equipped naval hospitals far behind the guns.

The first care a wounded serviceman receives in amphibious warfare is given by the hospital corpsman. These men, Captain Johnson stressed, are the first essential of naval medicine. They go into the foxholes and often dig them themselves. They care for the wounded on the firing line. They are equipped to do minor surgery, care for fractures, stop hemorrhages and treat shock. The ultimate outcome of an injury depends upon what is done immediately by a hospital corpsman, or naval doctor, at the time of injury.

The immediate local application of the new sulfonamides which prevent the growth of infectious bacteria has greatly reduced the number and severity of infections. Each of these drugs is useful for a certain type of infecting organism. The naval hospital corpsman is well supplied with sulfonamides and carefully instructed in their use.

Following first aid by the hospital corpsman, a wounded fighter is carried to a nearby field hospital. These are portable units set up under canvas almost on the firing lines. Here the first-aid treatment is supplemented, and, if necessary, the patient is prepared for quick transportation to the nearest advanced base hospital.

The advanced base hospital is the Navy's medical answer to amphibious warfare. It is a specially designed unit of varying size, which can be quickly set up and easily moved as the fighting front progresses. It may house from 25 to several thousand beds. Each has its special equipment and complement of personnel according to its special needs, for the advanced base hospital is functioning from the equator to the Aleutians.

Behind the advanced base hospital are the splendid, modern naval hospitals in safe areas, distant from the actual fighting. Here final treatment of patients can be carried out under ideal conditions, with the best food, medicines and professional skill. The sick and wounded are brought here by hospital transports, called "sea-going hospitals." The transports are large, comfortable ships carrying 500 to 1000 troops, and are staffed with specialists capable of carrying on treatment begun on the scene of battle. Their medical personnel is expert in the technique of loading and unloading patients—a job requiring great ingenuity and speed.

Sometimes, however, a wounded man needs immediate surgery and the elaborate care and equipment possible only

MODERN KNIGHT—This latest flak helmet designed to protect the head and neck of aerial gunners is made up of many small metal squares and is lined with sponge rubber to reduce shock and concussion. Head and neck wounds, suffered by 25% of air casualties, should be greatly reduced by this headgear. Official U. S. Army Air Forces photograph.

at the big hospitals far from battle. For these emergency cases, the Navy operates a fleet of special ambulance planes, carrying up to 30 wounded. As soon as an advanced base is occupied, the naval construction battalions build airstrips for these planes, and the long trip to a safe-area hospital is reduced from days to hours.

When, during a field tour, Captain Johnson arrived at Munda, the Japs were still shelling our beachheads with mortars concealed in the hills. One of their shells landed in the middle of a Navy chowline at breakfast time and a fragment struck a man in the occipital bone, located at the base of the skull. The fragment pierced his brain. Immediate dressing was done by a naval physician, but the injury required the most delicate surgical care, and quickly. He was flown by ambulance plane to the hospital at Espiritu Santo and 20 minutes after he left the plane was on the operating table. A skilled neuro-surgeon removed the shell fragment from the brain. After several weeks, the patient, now in excellent spirits and good physical condition, was returned to the United States for rehabilitation.

Less dramatic, but of wider benefit, is the brilliant naval research into wartime diseases, or diseases which become particularly dangerous in war. One of these is tetanus, most horrible death a man can die. Not a single case of tetanus has been seen in this war, thanks to protective inoculation given all enlisted men and officers as part of their naval "medical indoctrination." Tetanus inoculation was developed for the Navy by Capt. W. W. Hall (M.C.) USN, editor of the Bureau of Medicine and Surgery's *News Letter*. A constant terror in the last war, tetanus no longer lurks on the battlefield or along the hospital corridors. Its elimination is of incalculable benefit.

Backing all naval research is a staff of medical scientists gathered from civilian life and the naval medical corps by the surgeon general of the Navy, Vice Admiral Ross T. McIntire. This body of distinguished men is called the Naval Research Commission. Its headquarters is at the National Naval Medical Center in Bethesda, Md., and its job is the constant search and perfection of new surgical and clinical techniques, new drugs and sera. Like everything else in war, the pace with which research results are given practical expression is amazingly swift. Before the war, it was usually a matter of months or years before the findings of the laboratory were available to practicing physicians. Today it can be a matter of days, or even hours.

The output of the Naval Research Commission is published in a pocket-size, photostated *News Letter* by the Bureau of Medicine and Surgery, and regularly available to all naval medical staff officers. The perfection of the Navy's system of medical care is due to more than military discipline and good administration. Behind these phases is expert research, made quickly available.

Men and officers of the Navy realize in a very practical way the protection their crack medical staff gives, and their morale in battle is none the worse for this realization.

But even the most sober-minded of medical officers will admit that above and beyond all their drugs and skill is one "magic medicine" which produces the most miraculous cures—a trip back home, for rehabilitation. Orders to Tulsa or Flatbush produce a boost in morale which confounds even Surgeon General McIntire's learned staff.

Science News Letter, April 29, 1944

METALLURGY

New Type Copper Powder Produced by Electrolysis

➤ A NEW TYPE of copper powder recently produced in the electrolytic refining of copper was described at the Milwaukee meeting of the Electrochemical Society by W. H. Osborn and S. B. Tuwiner of the Phelps Dodge Corp., Laurel Hill, N. Y. The powder is useful as a bronze powder but does not have the properties necessary for sintered metal products.

This new crystalline metallic material may be obtained as a by-product in refining copper by electrolysis; quantity production will depend upon future uses which may be developed. It is

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ideally suited, they stated, to further processing either by ball milling, or by stamp milling, obtaining a very fine grade of bronze powder. The particles formed are flakes. "It is obvious," they said, "that the particles of which these deposits are composed grew in two dimensions only."

In the investigation made which resulted in the discovery of this new type of copper, it was found that when the cathodes in the electrolytic bath had received an application of certain oils, the deposits on them are brittle. The cathode is the electrical terminal on which the refined metal is deposited in the electrolytic process.

"In particular," they declared, "certain asphaltic oils and such vegetable oils as corn oil gave deposits over ten-day periods which were easily stripped from the rolled cathode surface." They were brittle enough to be easily broken up. Castor oil, oxidized with perchloric acid, is preferred. The cathodes are dipped in heated oil and allowed to drain.

Science News Letter, April 29, 1944

PSYCHIATRY

Psychiatry at the Front

➤ AN IMPORTANT step toward salvaging for combat or other active military duty the men who would otherwise crack up mentally under the excessive strains of warfare, is the appointment of a psychiatrist on the staff of each Army division.

This physician will live with the men and share their experiences, "ride their vehicles, participate in their bivouacs, take their infiltration courses." Thus he will gain the respect of the soldiers and will also put himself in a position where he can most effectively apply his professional skill and judgment to problems of training and combat.

Acute manpower shortage has led to the reversal of the Army's former practice of wholesale discharge of men believed to be emotionally unfit for military service, it is disclosed in a special article in the *Bulletin of the U. S. Army Medical Department* (March) announcing this new step in preventive mental medicine.

Now the new Division Neuropsychiatrist will be expected to save such men through his clinical judgment, skill, contacts and influence. He will get personally acquainted with the line officers and be in a position to help them when they seek his advice. He will "forget psychiatric jargon and explain his findings and recommendations in simple terms," the article, which was prepared in the Office of the Surgeon General, states.

For the first time in the Army, the psychiatrist will have an opportunity in some degree to modify and influence the soldier's environment, it is explained, so as to improve morale and prevent malajustments. He will advise in all matters pertaining to the mental health of the command.

The Division Neuropsychiatrist will form a team with the classification officer to aid in the placing of individual soldiers where they can function best and thus eliminate improper placement which is a factor in poor mental health.

He will visit division dispensaries and help the medical officers to solve problems where physical ailments are linked with mental or emotional maladjustment.

And when the men reach combat, the Division Neuropsychiatrist will supervise the care of the neuropsychiatric casualties which, it has been found, are numerous in heavy combat. (*See SNL*, April 22)

Science News Letter, April 29, 1944

MILITARY SCIENCE

Ancient Warlike Device Gets New Improvement

➤ A MODERN improvement on a warlike device that is at least as ancient as the wars between the Greeks and Persians is the subject of patent 2,346,713, granted to an Army officer, Maj. Brooks Walker, and assigned royalty-free to the government.

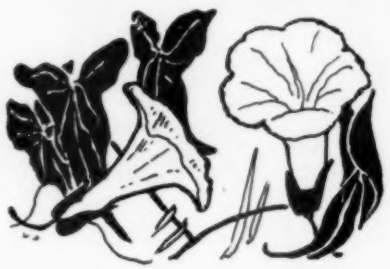
The device is a caltrop. In its original form, the caltrop was a group of four sharp spikes radiating from a common center in such a way that one would always fall pointing upward when tossed on the ground. Man or horse stepping on a caltrop could be considered through for the day.

Major Walker's improvement consists merely in making the spikes hollow with openings near the ends. Any pneumatic-tired vehicle running over one of them will of course lose the air from the punctured tire through the hole, and be as effectively crippled as any of the King's horses or the King's men of old.

Science News Letter, April 29, 1944

BOTANY

NATURE RAMBLINGS
by Frank Thone



Radical Research

➤ MIDWESTERN farmers often assert that no one has ever seen the lower end of a bindweed root. Some go further and declare that they don't have any lower ends—that they come straight up through the ground from the place where they were invented. Certain it is, in any case, that this field-ruining wild morning-glory, probably the worst single weed species in the great Grain Belt, is extremely deep-rooted.

Now, however, someone has seen the lower end of a bindweed root. He is Dr. John C. Frazier, a young botanist on the staff of the Kansas State Experiment Station. Dr. Frazier is an exceedingly persistent young man, for he dug down alongside one bindweed root for a little more than 23 feet before he got to the bottom of it.

Dr. Frazier did his digging into the hidden life of the bindweed in the course of researches aiming at a better knowledge of why and how this ill weed grows so apace. By planting its seeds in cleared soil and keeping close track of root growth week by week, he obtained a more accurate picture of the bindweed's potentialities for mischief than has ever been available.

Even when only two weeks old, bindweeds already had six-inch-deep roots. Before they were three months old, their roots were down more than a yard. And at the end of the 120th week of their persistent, perennial lives, they were sending their roots down to the 23-foot level.

At the same time they were spreading sidewise at comparable rates. When the roots were down a yard, they had a radial spread of a yard and six inches. When they had got to the 23-foot length, they were spreading "at least" 16 or 17 feet.

Bindweed roots not only spread; they start new bindweeds every here and there. Buds appear in them at irregular intervals. If the root is near the surface, the bud sends up a new stem at once. If it is deeper, it produces a rhizome, or underground stem, which in turn starts overground stems on their twining, strangling careers.

Science News Letter, April 29, 1944

• Books Off the Press •

ARCTIC MANUAL—Vilhjalmur Stefansson—*Macmillan,* 556 p., illus., $3.

BIOLOGY AND MAN—Benjamin C. Gruenberg and N. Eldred Bingham—*Ginn & Company,* 719 p., illus., $2.24.

GLIDERS AND GLIDER TRAINING—Emanuele Stieri—*Duell, Sloan & Pearce,* 118 p., $3. A picture history as well as a handbook of gliders and glider training.

HANDBOOK OF COMMERCIAL, FINANCIAL AND INFORMATION SERVICES — Walter Hausdorfer, comp. — *Special Libraries Assn,.* 207 p., paper, $3.

HEATING, VENTILATING, AIR CONDITIONING GUIDE, 1944; Vol. 22—*American Society of Heating and Ventilating Engineers,* 1,272 p., illus., $5.

I LIVED WITH LATIN AMERICANS—John L. Strohm—*Wilcox & Follett,* 377 p., illus., $2.50.

ILLUSTRATED FLORA OF THE PACIFIC STATES, Vol. II, Buckwheats to Kramerias —Leroy Abrams—*Stanford Univ. Press,* 635 p., illus., $7.50.

INVESTIGATIONS IN EROSION CONTROL AND RECLAMATION OF ERODED LAND AT THE BLACKLAND CONSERVATION EXPERIMENT STATION, TEMPLE, TEXAS, 1931-41—H. O. Hill, W. J. Peevy, A. G. McCali and F. G. Bell—*Gov't. Printing Off.,* 109 p., illus., paper, 20c., U. S. Dept. of Ag. Technical Bull. No. 859.

JOURNAL OF JOS. W. FAWCETT—*David K. Webb Private Press,* 59 p., $1.

MANUAL FOR AVIATION CADETS—John R. Hoyt—*McGraw-Hill,* 199 p., illus., $2.50.

OCEANOGRAPHIC OBSERVATIONS ON THE "E. W. SCRIPPS" CRUISES OF 1940: Cruises X-XVI—H. U. Sverdrup and the Staff of the Scripps Institution of Oceanography—*Univ. of Cali'. Press,* 87 p., $1.

PALESTINE, LAND OF PROMISE — Walter Clay Lowdermilk—*Harper,* 236 p., $2.50.

PETROLEUM AND AMERICAN FOREIGN POLICY — Herbert Feis — *Food Research Inst.,* 62 p., paper, 50c., Commodity Policy Studies No. 3.

PILE-DRIVING HANDBOOK—Robert D. Chellis—*Pitman,* 276 p., illus., $4.50. Theory, design and practice of pile foundations.

PLASTICS FOR INDUSTRIAL USE—John Sasso —*McGraw-Hill,* 229 p., illus., $2.50. An engineering handbook of materials and methods.

PLENTY OF PEOPLE—Warren S. Thompson —*Jaques Cattell Press,* 246 p., $2.50.

SMALL COMMUNITY HOSPITALS—Henry J. Southmayd and Geddes Smith—*Commonwealth Fund,* 182 p., $2.

STUDY AND REVISION OF ARCHIMEDES (HALL)—G. E. Condra and M. K. Elias —*Geological Soc. of America,* 243 p., illus., paper $2.50, Special Papers No. 53.

THE THEORY OF THE GYROSCOPIC COMPASS AND ITS DEVIATIONS—A. L. Rawlings—*Macmillan,* 182 p., illus., 2nd ed., $3.

TOWARDS A DEMOCRATIC PEACE—GERMANY—Hiram Motherwell—*Am. Friends of German Freedom,* 39 p., paper, 25c.

TROPICAL NURSING—A. L. Gregg—*Phil. Library,* 185 p., illus., $3, 2nd ed.

TVA — DEMOCRACY ON THE MARCH — David E. Lilienthal — *Harper,* 248 p., $2.50.

TWENTIETH CENTURY ENGINEERING — C. H. S. Tupholme—*Phil. Library,* 201 p., illus., $3.00.

VERIFIABILITY OF VALUE—Ray Lepley—*Columbia Univ. Press,* 267 p., $3.50.

THE WAR AND MENTAL HEALTH IN ENGLAND—James M. Mackintosh—*Commonwealth Fund,* 91 p., 85c.

Science News Letter, April 29, 1944

PSYCHIATRY

Psychiatrists Urged To Start Rehabilitation

➤ PSYCHIATRISTS, psychiatric social workers and clinical psychologists at the Chicago meeting of the American Orthopsychiatric Association were called on to start immediate action in their own communities for psychiatric rehabilitation of service men discharged from the armed forces because of medical or psychiatric disabilities or both.

The call was issued by Dr. Thomas A. C. Rennie, of the New York Hospital and Cornell Medical College, director of the division of rehabilitation of the National Committee for Mental Hygiene.

"The problems facing the men discharged from service are multiple," he said. "Perhaps the most common is the mistaken sense of being stigmatized by discharge for a nervous or mental condition. Although employment in the main is now easy to obtain, some employers refuse to take back men diagnosed as psychoneurotic.

"Socially these men find the adjustment at home difficult," he continued, pointing out that companionship is denied them because men their age are in service. They are ashamed or unable to seek work, ashamed to telephone former friends, uncertain how to explain their reappearance into civilian life and may make up some symptom to explain their discharge. Many of them stay at home, only occasionally wandering out alone in the evening to a movie.

Many know their diagnoses but their attempts to read up on the subject of psychoneurosis confuse them. Their parents are equally baffled and their fear and over-solicitude make the problem worse. When the men try to get help they find "too many jobs too poorly chosen for their needs" offered them, so they quickly shift from one job to another. Many groups and agencies are eager to help, but their activities may only add to the men's confusion, especially as the agencies frequently are working without reference to each other and without knowledge of the varied resources available.

Science News Letter, April 29, 1944

CHEMISTRY

Plastic Eyes Developed Which Are Non-Explosive

➤ PLASTIC EYES are being successfully produced in this country. Equalling glass eyes in popularity, they have the advantage of being non-explosive. In rare instances a glass eye has exploded due to temperature changes.

Before the war practically all artificial eyes were blown from a special glass, with a velvety texture, that could be secured only from a small town in Germany. Today the German monopoly has been broken and the material for glass as well as plastic artificial eyes are being made in America.

Science News Letter, April 29, 1944

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❁ *A SECRET PANEL in a patented bathing cap has a weatherproof lining opened with a zipper which extends from near the front to the back of the neck. The lining is vulcanized to the cap at its edges and provides a safe place for valuables.*

Science News Letter, April 29, 1944

❁ *MAGNIFYING lenses set in the handles of safety razors close to the head and blade permit users to see an enlargement of the portion of the face just ahead of the cutting edges. In this newly patented device the lens and its frame are part of the handle.*

Science News Letter, April 29, 1944

❁ *TWO-WAY blue light railroad signal lantern of an improved design now patented, has several electric bulbs and the necessary control equipment so that any one may be used as desired. With it at least one lamp should always be in good condition.*

Science News Letter, April 29, 1944

❁ *ADJUSTABLE nursing-bottle holder, recently patented, permits the bottle to be raised by air pressure to a height and angle which insures gravity flow to the baby. An inflation chamber between the base and the bottle may be expanded with air from a rubber bulb bellows.*

Science News Letter, April 29, 1944

❁ *HEAVY PAPER rings or "wheels" encircling heavy aerial bombs ready for shipment are shown in the picture. A synthetic ureaformaldehyde resin makes the paper tough and waterproof enough to withstand rain and snow, and also shock-resistant. Replacing steel, the paper saves millions of pounds of the metal.*

Science News Letter, April 29, 1944

❁ *A FLAT expansible chamber, filled with a liquid of low boiling point and placed in the bottom of the ice tray in a refrigerator, is one feature of a newly patented device. When the tray is removed from the refrigerator the warm room causes the chamber to expand and loosen the ice cubes.*

Science News Letter, April 29, 1944

❁ *CIRCULAR slide rules, six inches in diameter, are now available in a white plastic material. They are light in weight, accurate, easily cleaned and almost unbreakable. The length of the multiplication, division scale is 13.8 inches. Both sides have scales for various calculations.*

Science News Letter, April 29, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 205.

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